

LORIS BAZZANI

SENIOR COMPUTER VISION SCIENTIST AT AMAZON

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<http://lorisbaz.github.io>

<http://scholar.google.com/citations?user=1cdNGL4AAAAJ&hl=en>

CURRENT POSITION

Amazon

May 2018-now

Senior Computer Vision Scientist

- Creating novel shopping experiences that involve vision and language
- Improving accessibility of product images

PREVIOUS EXPERIENCE

Amazon

Jan 2016-Apr 2018

Computer Vision Scientist

- Prototyping and developing video understanding models for Prime Video

Dartmouth College

Jan 2014-Dec 2015

Postdoc at the Visual Learning group

- Research on object localization and detection in images, deep learning and salience prediction
- Supervisor: Prof. L. Torresani

University of Verona

Dec 2013

Research Collaborator

- Research on object recognition and saliency
- Supervisor: Dr. M. Cristani

Italian Institute of Technology

Dec 2011–Nov 2013

Postdoc at the Pattern Analysis and Computer Vision group

- Research on social interaction analysis in videos using dynamic Bayesian nets and Bayesian non-parametric models. Research on kernel-based object recognition and person re-identification
- Supervisor: Prof. V. Murino

University of British Columbia

May–Nov 2010

Research Intern at the Laboratory for Computational Intelligence

- Research on restricted Boltzmann machines, deep learning and attentional models
- Supervisor: Prof. N. de Freitas

EDUCATION

University of Verona

Jan 2009–May 2012

Ph.D. in Computer Science

- PhD Thesis: Beyond multi-target tracking: statistical pattern analysis of people and groups.
- Topics: person re-identification, individual-group tracking and attentional models
- Advisors: Prof. V. Murino, Dr. M. Cristani
- Reviewers: Prof. A. Del Bimbo, Prof. R. T. Collins

University of Verona

Sep 2006–Dec 2008

M.S. in Intelligent and Multimedia Systems

- Thesis topics: particle filtering and multi-target tracking
- Advisors: Prof. V. Murino, Dr. M. Cristani
- *Summa cum laude*

University of Verona

Sep 2003–Dec 2006

B.S. in Information Technology

- Thesis topics: classification, MRI, and mental health application

- Advisors: Prof. V. Murino, Dr. U. Castellani

AWARDS AND GRANTS

- **IBM Best Student Paper Award**, track: Computer Vision at International Conference on Pattern Recognition ICPR, 2010
- **Scholarship** from University of Verona that supported my Ph.D. from Jan. 2009 to Dec. 2011
- **Scholarship** from EU-Project FP7 SAMURAI, grant FP7-SEC-2007-01 No. 217899, that contributed to support my Ph.D. from Jan. 2009 to Dec. 2011
- **Travel grant** from University of British Columbia to attend Neural Information Processing Systems, 2010
- **Travel grant** from International Machine Learning Society to attend the International Conference on Machine Learning, 2011

TEACHING

Dartmouth College

Winter 2015

Machine Learning

- Tutor of the undergrad course taught by Prof. L. Torresani

Italian Institute of Technology

Winter 2013

An Introduction to Machine Learning and Computer Vision

- Course for Ph.D. students, organized in collaboration with other members of PAVIS group

University of Modena and Reggio Emilia

Spring 2011

Person Re-identification

- Person Re-identification: a recent issue for the video surveillance community and a technique for approaching it
- Held at the Short Spring School in Surveillance, organized in collaboration with Dr. M. Cristani

PUBLICATIONS

[Blue color](#) = top-tier computer vision/machine learning conferences or journals.

Vision and language

- Y. Chen, and L. Bazzani. Learning Joint Visual Semantic Matching Embeddings for Language-guided Retrieval, ([ECCV](#)), 2020.
- Y. Chen, S. Gong, and L. Bazzani. Image Search with Text Feedback by Visiolinguistic Attention Learning, ([CVPR](#)), 2020.
- L. Bazzani, T. Domhan, and F. Hieber. Image Captioning as Neural Machine Translation Task in SOCKEYE, Arxiv, 2018.

Person re-identification

- L. Bazzani, M. Cristani, and V. Murino. SDALF: Modeling human appearance with symmetry-driven accumulation of local features, Person Re-identification, 2014.
- D. Figueira, L. Bazzani, H.Q. Minh, M. Cristani, A. Bernardino, and V. Murino. Semi-supervised multi-feature learning for person re-identification, International Conference on Advanced Video and Signal-based Surveillance (AVSS), 2013.
- P. Salvagnini, L. Bazzani, M. Cristani, and V. Murino. Person re-identification with a PTZ camera: an introductory study, International Conference on Image Processing (ICIP), 2013.
- L. Bazzani, M. Cristani, and V. Murino. Symmetry-driven accumulation of local features for human characterization and re-identification, Computer Vision and Image Understanding ([CVIU](#)), 2013.
- B. I. Barbosa, M. Cristani, A. Del Bue, L. Bazzani, and V. Murino. Re-identification with RGB-D sensors, In 1st International Workshop on Re-Identification, 2012.
- L. Bazzani, M. Cristani, A. Perina, V. Murino. Multiple-shot person re-identification by chromatic and epitomic analyses, Pattern Recognition Letters, 2012.
- D. S. Cheng, M. Cristani, M. Stoppa, L. Bazzani, V. Murino. Custom pictorial structures for re-identification, British Machine Vision Conference ([BMVC](#)), 2011.

- L. Bazzani, M. Cristani, A. Perina, M. Farenzena, and V. Murino, Multiple-shot person re-identification by HPE signature, International Conference on Pattern Recognition (ICPR), 2010.
- M. Farenzena, L. Bazzani, A. Perina, V. Murino, and M. Cristani Person re-Identification by symmetry-driven accumulation of local features, International Conference on Computer Vision and Pattern Recognition (CVPR), 2010.

Attention and Saliency

- L. Bazzani, H. Larochelle, and L. Torresani, Recurrent Mixture Density Network for Spatiotemporal Visual Attention, International Conference on Learning Representations (ICLR), 2017.
- M. Denil, L. Bazzani, H. Larochelle, and N. de Freitas, Learning where to attend with deep architectures for image tracking, Neural Computation, 2012.
- L. Bazzani, N. de Freitas, H. Larochelle, V. Murino, J. Ting, Learning attentional policies for object tracking and recognition in video with deep networks, International Conference on Machine Learning (ICML), 2011.
- L. Bazzani, N. de Freitas, J. Ting, Learning attentional mechanisms for simultaneous object tracking and recognition with deep networks, Workshop on Deep Learning and Unsupervised Feature Learning at the Conference on Neural Information Processing Systems (NIPS), 2010.

Object Recognition and Classification

- H. Q. Minh, M. San Biagio, L. Bazzani, and V. Murino, Kernel Methods on Approximate Infinite-Dimensional Covariance Operators for Image Classification, Arxiv, 2016.
- M. San Biagio, H. Q. Minh, L. Bazzani, V. Murino. Approximate Log-Hilbert-Schmidt distances between covariance operators for image classification. International Conference on Computer Vision and Pattern Recognition (CVPR), 2016.
- L. Bazzani, A. Bergamo, D. Anguelov, L. Torresani. Self-taught object localization with deep networks. In IEEE Winter Conference on Applications of Computer Vision (WACV), 2016.
- H. Q. Minh, L. Bazzani, V. Murino, A unifying framework in vector-valued reproducing kernel Hilbert spaces for manifold regularization and co-regularized multi-view learning, Journal of Machine Learning Research, (JMLR), 2016.
- M. San Biagio*, L. Bazzani*, M. Cristani, V. Murino, Weighted bag of visual words for object recognition, In IEEE International Conference on Image Processing (ICIP), 2014. (* equal contribution)
- H. Q. Minh, L. Bazzani, V. Murino, A unifying framework for vector-valued manifold regularization and multi-view learning, International Conference on Machine Learning (ICML), 2013.

Social Interaction Analysis

- S. Vascon, and L. Bazzani, Group Detection and Tracking using Sociological Features, In Group and Crowd Behavior for Computer Vision, 2017.
- L. Bazzani*, M. Zanotto*, M. Cristani, V. Murino, Joint individual-group modeling for tracking. In IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), 2015. (* equal contribution)
- L. Bazzani, D. Tosato, M. Cristani, M. Farenzena, G. Paggetti, G. Menegaz, V. Murino, Social interactions by visual focus of attention in a three-dimensional environment, Expert Systems, 2013.
- L. Bazzani, V. Murino, and M. Cristani, Decentralized particle filter for joint individual-group tracking, International Conference on Computer Vision and Pattern Recognition (CVPR), 2012.
- L. Bazzani, M. Cristani, G. Pagetti, D. Tosato, G. Menegaz, V. Murino, Analyzing groups: a social signaling perspective, Video Analytics for Business Intelligence, 2012.
- M. Zanotto, L. Bazzani, M. Cristani, and V. Murino, Online bayesian non-parametrics for social group detection, In British Machine Vision Conference (BMVC), 2012.
- M. Cristani, L. Bazzani, G. Paggetti, A. Fossati, A. Del Bue, D. Tosato, G. Menegaz, V. Murino, Social interaction discovery by statistical analysis of F-formations, British Machine Vision Conference (BMVC), 2011.
- M. Cristani, G. Paggetti, A. Vinciarelli, L. Bazzani, G. Menegaz, V. Murino, Towards computational proxemics: Inferring social relations from interpersonal distances, International Conference on Social Computing (Social-Com), 2011.
- L. Bazzani, M. Cristani, and V. Murino, Collaborative particles filters for group tracking, International Conference on Image Processing (ICIP), 2010.

- M. Farenzena, A. Tavano, L. Bazzani, D. Tosato, G. Paggetti, G. Menegaz, V. Murino, and M. Cristani, Social interaction by visual focus of attention in a three-dimensional environment, Workshop on Pattern Recognition and Artificial Intelligence for Human Behavior Analysis (PRAI*HBA), 2009.
- M. Farenzena, M. Cristani, L. Bazzani, and V. Murino, Towards a subject-centered analysis for automated video surveillance, International Conference on Image Analysis and Processing (ICIAP), 2009.

Others

- S. Martelli, M. Cristani, L. Bazzani, D. Tosato, and V. Murino, Joining feature-based and similarity-based pattern description paradigms for object detection, In International Conference on Pattern Recognition (ICPR), 2012.
- M. Cristani, G. Roffo, C. Segalin, L. Bazzani, A. Vinciarelli, and V. Murino, Conversationally-inspired stylometric features for authorship attribution in instant messaging, In ACM Multimedia, 2012.
- L. Bazzani, M. Cristani, M. Bicego, and V. Murino, Online subjective feature selection for occlusion management in tracking applications, International Conference on Image Processing (ICIP), 2009.

Patents

- L Bazzani et al., Automated video ratings, US Patent 10,643,074.

CODING

Programming/Tools Python (> 6 years), MATLAB (> 6 years), Lua/Torch7 (> 1 year), JS (< 1 year), git, LATEX, bash scripting, AWS, Qualtrics.

Selected Contrib. Image to text module in [Sockeye](#) can be found [here](#).

REVIEWING ACTIVITY AND OTHERS

Journals	IEEE TPAMI, IJCV, IEEE Transactions on Multimedia, IEEE Transactions on Image Processing, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Systems, Man and Cybernetics - Part B, Pattern Analysis and Applications, Image and Vision Computing, Transactions on Information Forensics & Security, PLOS ONE, Neurocomputing.
Conferences	NIPS, ICML, ICLR, CVPR, ICCV, ECCV, BMVC, IROS, ICRA.

REFERENCE LIST

- **Lorenzo Torresani.** Supervisor of the postdoc at Dartmouth College.
- **Vittorio Murino.** Advisor of the PhD at University of Verona and the postdoc at the Istituto Italiano di Tecnologia.
- **Nando de Freitas.** Supervisor during the intership at the University of British Columbia.
- **Marco Cristani.** Collaboration during the PhD at University of Verona and the postdoc at the Istituto Italiano di Tecnologia.
- **Hugo Larochelle.** Collaboration for the attentional modeling project.